Marine Biologist: Sharks

Performance Task

Introduction

More than 30 percent of the world's sharks are endangered, threatened, or vulnerable to extinction. Sharks worldwide are threatened by human activities such as overfishing, exploitation for certain body parts, habitat degradation, and sometimes, outright slaughter. In order to monitor shark populations, migration patterns and behavior, sharks can be tagged and monitored to help scientists learn more about sharks and their life cycle.

Understanding shark movement, behavior and location is very important to conserve our sharks. Tagging is an important tool in learning shark behavior. We can help to conserve threatened sharks by using data collected by tags to learn more about shark movements and behaviors. Tagging also helps us set protection boundaries around shark gatherings to insure that fishing vessels are not moving into core areas the sharks are using.

In this task, students will take on the role of a Marine Biologist who specializes in sharks. The students will be charged with creating products to inform others about different species of sharks, their movements and habitat.

**Teacher note: For an extension, a suggested book is The Adventures of Shark Stanley and Friends by Ben Goldfarb and Leah Meth.

Big Idea / Essential Questions

Big Idea

- Different characteristics of plants and animals help some populations survive and reproduce in greater numbers.
- Technology is created, used and modified by humans.
- Data can be modeled and used to make inferences.

Essential Questions

- How does the variation among animals affect their survival?
- In what ways do humans create, use, and modify technologies?
- How can data be organized and represented to provide insight into the relationship between quantities?
- How do humans impact animal populations?

G.R.A.S.P.

Goal

As a marine biologist who specializes in sharks, you have learned a great deal about these fish and their habitats. Since many sharks are endangered, you want people to know it is important to understand and conserve these fish. Your goal will be to inform other people about the different species of sharks, the habitats they live in and where they travel.

Role

You are part of a team of marine biologists whose passion is to educate people about sharks to help the species thrive in their habitats.

Audience

You have been asked to create products for elementary school students to help them understand the different types of sharks, where they live, what they eat, and what can be done to help preserve them.

Situation

More than 30 percent of the worldâ€™s sharks are endangered, threatened, vulnerable to extinction or near threatened. Sharks worldwide are threatened by human activities such as overfishing, exploitation for certain body parts, habitat degradation, and sometimes, outright slaughter. In order to monitor shark populations and behavior, sharks are tagged and tracked.

As a marine biologist who specializes in shark tagging, your passion is to educate people about sharks to help the species thrive in their habitats. You want to inform people about the different species of sharks, the habitats they live in and where they travel. Since most sharks are an endangered species, you want people to know it is important to understand and conserve these fish.

You will use the most popular shark tagging website or app to help with the products below. This is called Ocearch and can be found here:
https://www.ocearch.org/tracker/?list

Other resources that may be helpful are:

https://www.enchantedlearning.com/subjects/sharks/index.html

https://www.kidzone.ws/sharks/facts9.htm

https://www.sharksider.com/types-of-sharks/

Products

1. Infographic

Using the Ocearch or another website, choose a type shark you would like to learn more about. Do further research on this type of shark and create an Infographic that will showcase this type of shark to others who are not familiar with this species. Be sure to include the shark's scientific name, size, weight, life span, habitat, location, prey and predator information, as well as any other interesting facts about this type of shark. Be sure your infographic is colorful and easy to read and understand.

Infographic

Achievement Levels	1	2	3	4
Life Science and Habitats (x1)	Product represents a minimal understanding that living things depend on their habitat to meet their basic needs.	Product represents some understanding that living things depend on their habitat to meet their basic needs.	Product represents an adequate understanding that living things depend on their habitat to meet their basic needs.	Product clearly represents a thorough understanding that living things depend on their habitat to meet their basic needs.
Content (x1)	Little critical information about the shark is included within the product.	Some critical information about the shark is included within the product.	Most critical information about the shark is included within the product.	All critical information about the shark is included within the product.
Using Geographic Information (x1)	Student uses little information from the map to make connections between shark, location, and environments.	Student uses some information from the map to make connections between shark, location, and environments.	Student uses information from the map to make connections between shark, location, and environments.	Student expertly uses information from the map to make connections between shark, location, and environments.
Infographic Design (x1)	The infographic uses few fonts, graphics, attributes making it difficult to understand.	The infographic makes use of some appropriate fonts, graphics and attributes making it easy to understand and providing some important information.	The infographic uses sufficient knowledge of fonts, graphics and attributes making it easy to understand providing adequate information.	The infographic employs a deep knowledge of fonts, graphics and attributes making it visually appealing and easy to understand providing critical information.
Infographic Layout (x1)	The layout is challenging to see and read. The presentation does not flow from one part to another.	The layout is a little difficult to see and read. The presentation somewhat flows from one part to the next.	The layout is mostly easy to see and read. The presentation flows from one part to the next.	The layout is easy to see and read. The presentation flows well from one part to the next.
Research (x1)	Product shows that little research was done around the topic.	Product shows that some research was done around the topic.	Product shows that research was done around the topic.	Product shows that thorough research was done around the topic.

2. Storybook

You want to promote protection of sharks by creating an animated story of a shark. You can use technology such as Storybird, Toontastic, Puppet Pals, or you can do it with paper, markers and crayons.

Start by going to Ocearch's website or app and choose a shark. Create an

animated story about the shark you chose and the locations that it has visited according to Ocearch. You want the story to appeal to young readers so be sure to make it engaging with many pictures. Include educational information about your shark such as the scientific name, size, sex and weight. Talk about how it grows throughout its life, where it lives and what it eats.

Storybook

Achievement Levels	1	2	3	4
Life Science and Habitats (x1)	Product represents a minimal understanding that living things depend on their habitat to meet their basic needs.	Product represents some understanding that living things depend on their habitat to meet their basic needs.	Product represents an adequate understanding that living things depend on their habitat to meet their basic needs.	Product clearly represents a thorough understanding that living things depend on their habitat to meet their basic needs.
Using Geographic Information (x1)	Student uses little information from the map to make connections between shark, location, and environments.	Student uses some information from the map to make connections between shark, location, and environments.	Student uses information from the map to make connections between shark, location, and environments.	Student expertly uses information from the map to make connections between shark, location, and environments.
Technology (x1)	The technology applications utilized do not connect the story and topic. The graphics and fonts are unattractive and do not connect with the topic of the story.	The technology applications utilized connect the story and topic. Some graphics and fonts are attractive and connect with the topic of the story.	The technology applications utilized enhance the story and topic. Most graphics and fonts are attractive and support the topic of the story.	The technology applications utilized strongly enhance the story and topic. All graphics and fonts are attractive and support the topic of the story.
Research (x1)	Product shows that little research was done around the topic.	Product shows that some research was done around the topic.	Product shows that research was done around the topic.	Product shows that thorough research was done around the topic.
Writing (x1)	The language of the product does not engage the audience with the information. The text has many errors in grammar or spelling.	The language of the product somewhat engages the audience with the information. The text has some errors in grammar or spelling.	The language of the product engages the audience with the information. The text has few errors in grammar or spelling.	The language of the product engages the audience with all of the information. The text has no errors in grammar or spelling.

3. Life Cycle

You will select one type of shark and create a diagram of its life cycle. Be sure to research how this type of shark has babies. Include the various stages of life and how many years the shark is in each stage. This can be done by hand or using a technology tool.

These websites may be helpful:
https://sciencing.com/life-cycle-shark-6723691.html
https://animalsake.com/life-cycle-of-sharks

Life Cycle

Achievement Levels	1	2	3	4
Research (x1)	Product shows that little research was done around the topic.	Product shows that some research was done around the topic.	Product shows that research was done around the topic.	Product shows that thorough research was done around the topic.
Captions and Labels (x1)	One or fewer of the stages of the life cycle have captions and labels.	Two of the stages of the life cycle have captions and labels.	Three of the stages of the life cycle have captions and labels.	All stages of the life cycle have captions and labels.
Diagram (x1)	Diagram is minimally neat, colorful, or readable.	Diagram is partially neat, colorful, and readable.	Diagram is mostly neat, colorful, and readable. and includes details that highlight features.	Diagram is neat, colorful, and easy to read. and includes excellent use of details that highlight features
Content (x1)	Details on the diagram minimally help the reader understand what is happening during each stage of a shark's life cycle.	Details on the diagram help the reader partially understand what is happening during each stage of a shark's life cycle.	Details on the diagram help the reader sufficiently understand what is happening during each stage of a shark's life cycle.	Details on the diagram help the reader thoroughly understand what is happening during each stage of a shark's life cycle.

4. Oral Presentation

The sharks of the world are quickly becoming endangered, and some are even in threat of extinction. You and your team will be educating elementary school students about helping to conserve sharks. You will need to do research on why shark populations are low and what can be done to help. You may want to have a slideshow (Google slides, Powerpoint, Prezi) to go along with your presentation. This slideshow can then be put onto the schools website for everyone in the community to view.

Oral Presentation

Achievement Levels	1	2	3	4
Human Impact on Animals (x1)	Product provides very little accurate facts or details that help show the importance of conserving sharks.	Product provides some facts and details that somewhat show the importance of conserving sharks.	Product provides accurate facts and details that help show the importance of conserving sharks.	Product provides many accurate facts and details that help show the importance of conserving sharks.
Support Materials (x1)	Presentation does not contain any relevant information, concepts, or ideas and there are no visual aids included.	Presentation contains some important information, concepts, or ideas that are supported by some visual aids such as pictures.	Presentation contains important information, concepts, ideas supported by visual aids such as pictures.	Presentation contains important and clear information, concepts, ideas supported by excellent visual aids such as pictures.
Informative Speaking (x1)	Incomplete explanation provided.	Partial explanation is provided that includes key points.	Explanation is provided with key points supported by facts and details.	Excellent explanation provided that emphasizes key points supported by facts and details.
Delivery of Presentation (x1)	Presenter makes eye contact, has good posture and adequate volume throughout little of the presentation.	Presenter makes eye contact, has good posture and adequate volume throughout some of the presentation.	Presenter makes eye contact, has good posture and adequate volume throughout most of the presentation.	Presenter makes eye contact, has good posture and adequate volume throughout the whole presentation.

Achievement Levels	1	2	3	4
Research (x1)	Product shows that little research was done around the topic.	Product shows that some research was done around the topic.	Product shows that research was done around the topic.	Product shows that thorough research was done around the topic.

5. Shark Size Chart

Using the Ocearch website or app, choose one shark for each species listed (you will find all of the species listed in the filter). On a chart, record the species, the name of the shark you chose, and the age, weight, and length. Ocearch shows the length in feet and inches. Add a column to your chart that shows this conversion as feet, using a fraction for part of a foot (for example, 7 ft 6 in would be 7 Â½ feet). You will use this chart to help you create your Line Plot.

Ocearch website: https://www.ocearch.org/tracker/?list

Shark Size Chart

Achievement Levels	1	2	3	4
Mixed Numbers (x1)	Product shows very little understanding of fraction concepts by representing few measurements as accurate mixed numbers.	Product shows some understanding of fraction concepts by representing some measurements as accurate mixed numbers.	Product shows adequate understanding of fraction concepts by representing most measurements as accurate mixed numbers.	Product shows strong understanding of fraction concepts by representing each measurement as an accurate mixed number.
Unit Conversion (x1)	Product shows no measurements were correctly converted to feet.	Product shows few measurements were correctly converted to another feet.	Product shows most measurements were correctly converted to feet.	Product shows all measurements were correctly converted to feet.
Organization of Chart (x1)	The data collected is unorganized and lacks appropriate units or labels.	The data collected is somewhat organized in a table or chart containing appropriate units or labels.	The data collected is organized in a table or chart containing appropriate units and labels.	The data collected is organized in a neat, easy to read table or chart containing appropriate units and labels.
Technology Use (x1)	Product shows data from few of the species of sharks listed on the website/app	Product shows data from some of the species of sharks listed on the website/app.	Product shows data from most of the species of sharks listed on the website/app	Product shows data from every species of shark listed on the website/app.

6. Line Plot

** Teacher note: It may be helpful to have the students round their measurements to the nearest Â½ inch. You may need to help them with rounding fractions. (Suggestion: 1-3 twelfths round down to the whole number; 4-8 twelfths round to Â½; and 9-11 twelfths round up to the next whole number).

For this product you will use the length data you collected on the sharks you chose for the Shark Size Chart. You may also want to collect data from at least one other person or group. Using all of these lengths, create a Line Plot that shows the sizes of all of the sharks chosen. What is the difference in length of the largest and smallest sharks on your line plot? Are there any lengths that occur more than once? If you laid every one

of your sharks end to end, what would the total length be?

Line Plot

Achievement Levels	1	2	3	4
Representing Mixed Numbers on a Number Line (x1)	The line plot shows an axis that is not scaled correctly and/or does not relate to the lengths of the chosen sharks.	The line plot shows an axis that is scaled somewhat correctly and relates to the lengths of the chosen sharks.	The line plot shows an axis that is mostly scaled correctly and relates to the lengths of the chosen sharks.	The line plot shows an axis that is scaled correctly and relates to the lengths of the chosen sharks.
Line Plot Details (x1)	Line plot is constructed in a way that makes the data difficult to read or interpret.	Line plot is somewhat constructed using appropriate scale, labels and title.	Line plot is adequately constructed using appropriate scale, labels and title, and is easy to read and analyze the displayed data.	Line plot is thoroughly constructed using appropriate scale, labels and title, and is easy to read and analyze the displayed data.
Adding and Subtracting Mixed Numbers (x1)	Product shows few correct work and solutions when adding fractions and mixed numbers.	Product shows some correct work and solutions when adding fractions and mixed numbers.	Product shows most correct work and solutions when adding fractions and mixed numbers.	Product shows all correct work and solutions when adding fractions and mixed numbers.
Mathematical Practices (x1)	Poor use of mathematical practices to create an accurate line plot. Student shows little ability to understand representation and interpretation of data.	Fair use of mathematical practices to create an accurate line plot. Student shows some ability to understand representation and interpretation of data.	Good use of mathematical practices to create an accurate line plot. Student shows ability to understand representation and interpretation of data.	Excellent use of mathematical practices to create an accurate line plot. Student shows strong ability to understand representation and interpretation of data.